



شركة ميرك العربية السعودية  
MEIRC Saudi Arabia

## Programmable Logic Control (PLC)

### Duration 5 Days

### Introduction

This course converts the seemingly complex world of automation and Programmable Logic Controllers ( PLCs ) into practical lessons the average maintenance person can understand. We've taken information from thousands of pages of manufacturers' technical manuals (Allen Bradley, GE, Siemens, Omron, Modicon, Mitsubishi, Honeywell ...), combined it with twenty years of experience and a practical real world philosophy to give you simple, clear, and concise solutions to your everyday PLC problems

### Who Should Attend

- PLC Engineering and design personnel
- Maintenance and technical services personnel
- Process and operations personnel
- Technical and process managers
- Engineering and design personnel
- Electrical consulting engineers
- Electrical contractor

### Course Objectives

- Identify PLC components
- Read and interpret Ladder Logic
- Understand function and purpose of basic programming instructions
- Configure a PLC-based control system
- Relate actual PLC and PID instructions to "real world" applications
- Troubleshoot and correct PLC problems by identifying and isolating most common system faults\

### Course outline

#### INSTRUMENTATION AND PROCESS CONTROL

##### INTRODUCTION

- Overview of instrumentation and control
- Key building blocks of PLCs and SCADA systems
- Outline of the course

##### INTRODUCTION TO PROCESS MEASUREMENT

- Basic measurement concepts
- Definition of terminology
- Measuring instruments and control valves as part of the overall control system

##### PRESSURE MEASUREMENT

- Principle of pressure measurement
- Pressure transducers and elements

##### LEVEL MEASUREMENT

- Principles of level measurement
- Simple sight glasses
- Hydrostatic pressure
- Ultrasonic measurement
- Electrical measurement



- Density measurement

#### TEMPERATURE MEASUREMENT

- Principles of temperature measurement
- Thermocouples
- Resistance Temperature Detectors (RTD's)
- Thermostats

#### FLOW MEASUREMENT

- Principles of flow measurement
- Open channel flow measurement
- Oscillatory flow measurement
- Magnetic flow measurement
- Positive displacement
- Ultrasonic flow measurement
- Mass flow measurement

#### FUNDAMENTALS OF PROCESS LOOP TUNING

- Processes, controllers and tuning
- PID controllers
- Gain, dead time and time constants
- Process noise
- General purpose closed loop tuning method

#### INTRODUCTION TO CONTROL VALVES

- Introduction
- Definition of a control valve
- Cavitation
- Flashing

#### DIFFERENT TYPES OF CONTROL VALVES

- Globe Valves
- Butterfly
- Eccentric disk
- Ball
- Rotary Plug
- Diaphragm and Pinch

#### COMMUNICATIONS

#### FUNDAMENTALS OF PLCs

- Introduction to PLCs
- Alternative control systems – where do PLCs fit in
- Why PLCs have become so widely accepted

#### FUNDAMENTALS OF PLC HARDWARE

- Block diagram of typical PLC
- PLC processor module – memory organization
- Input / output section – module types
- Power supplies

#### FUNDAMENTALS OF PLC SOFTWARE

- Methods of representing Logic
- Ladder Logic basics
- The basic rules for programming
- Simple PLC programs